

Claims

1. A flame detection algorithm that processes a sequence of video images, to detect sequences of images of flames.
2. A system implementing the flame detection algorithm comprising a video source, a frame grabber and a processor and a means to trigger an external alarm when flame is detected.
3. An algorithm for filtering live or recorded video images so that changes within a well-defined frequency band, characteristic of flame like behaviour, is registered.
4. An algorithm that classifies changes in a sequence of images between flicker like behaviour and non flicker like behaviour.
5. An algorithm comprising the filters of claim 3 and claim 4 yielding a binary image of areas of flame like behaviour in a sequence of images.
6. An algorithm to compute the parameters of sparseness, and edge to volume ratio in the binary image resulting from the algorithm of claim 5.
7. An algorithm that determines, on the basis of the values returned by the algorithm of claim 6, whether to sound an alarm.
8. An optimal set of parameters for the algorithms of claims 3, 4, 5 and 6.
9. An algorithm that uses the technique in claim 3, followed by the technique in claim 4, followed by the technique in claim 5 to generate a binary image which is processed by the technique in claim 6 to generate parameters which can be used to decide whether a flame is occurring in the picture, which can differentiate between trees moving in the wind and flames, by including an additional decision based on the technique described in claim 7.

Pr. 5A.7

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